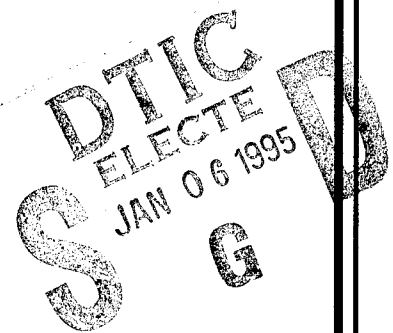




**REGULATORY JURISDICTION OF THE
STORM WATER MANAGEMENT PROGRAM
FOR SCOTT AIR FORCE BASE, ILLINOIS**

**Eric F. Hollins
Andrew W. Weisman
Roger Cawkwell**

**Pacific Environmental Services, Incorporated
4700 Duke Drive, Suite 150
Mason, OH 45040**



**OCCUPATIONAL AND ENVIRONMENTAL HEALTH DIRECTORATE
2402 E. Drive
Brooks Air Force Base, TX 78235-5114**

September 1994

Final Contractor Report for Period 1 January – 21 June 1994

Approved for public release; distribution is unlimited.

19950105 055

AND QUARTERMASTER'S

**AIR FORCE MATERIEL COMMAND
BROOKS AIR FORCE BASE, TEXAS**

ARMSTRONG

LABORATORY

NOTICES

This technical report is published as received and has not been edited by the technical editing staff of the Armstrong Laboratory.

Publication of this report does not constitute approval or disapproval of the ideas or findings. It is published in the interest of STINFO exchange.

When Government drawings, specifications, or other data are used for any purpose other than in connection with a definitely Government-related procurement, the United States Government incurs no responsibility or any obligation whatsoever. The fact that the Government may have formulated or in any way supplied the said drawings, specifications, or other data, is not to be regarded by implication, or otherwise in any manner construed, as licensing the holder, or any other person or corporation; or as conveying any rights or permission to manufacture, use, or sell any patented invention that may in any way be related thereto.

The mention of trade names or commercial products in this publication is for illustration purposes and does not constitute endorsement or recommendation for use by the United States Air Force.


The Office of Public Affairs has reviewed this report, and it is releasable to the National Technical Information Service, where it will be available to the general public, including foreign nationals.

This report has been reviewed and is approved for publication.

Government agencies and their contractors registered with Defense Technical Information Center (DTIC) should direct requests for copies to DTIC, Building #5, Cameron Station, 5010 Duke St., Alexandria VA 22304-2103.

Non-Government agencies may purchase copies of this report from: National Technical Information Services (NTIS), 5285 Port Royal Road, Springfield VA 22161-2103.


JOHN G. GARLAND III, LtCol, USAF, BSC
Contract Project Officer


JAMES D. MONTGOMERY, LtCol, USAF, BSC,
Chief, Bioenvironmental Engineering
Division

Accession For	
NTIS	CRA&I <input checked="" type="checkbox"/>
DTIC	TAB <input type="checkbox"/>
Unannounced <input type="checkbox"/>	
Justification _____	
By _____	
Distribution / _____	
Availability Codes	
Dist	Avail and/or Special
A-1	

REPORT DOCUMENTATION PAGEForm Approved
OMB No. 0704-0188

Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503.

1. AGENCY USE ONLY (Leave blank)		2. REPORT DATE September 1994	3. REPORT TYPE AND DATES COVERED Final - 1 January - 21 June 1994
4. TITLE AND SUBTITLE Regulatory Jurisdiction of the Storm Water Management Program for Scott Air Force Base, Illinois			5. FUNDING NUMBERS C - F33615-D-89-D-4000-29
6. AUTHOR(S) Eric F. Hollins Andrew W. Weisman Roger Cawkwell			
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Pacific Environment Services, Incorporated 4700 Duke Drive, Suite 150 Mason, OH 45040			8. PERFORMING ORGANIZATION REPORT NUMBER F029.000
9. SPONSORING/MONITORING AGENCY NAMES(S) AND ADDRESS(ES) Armstrong Laboratory (AFMC) Occupational and Environmental Health Directorate 2402 E. Drive Brooks Air Force Base, TX 78235-5114			10. SPONSORING/MONITORING AGENCY REPORT NUMBER AL/OE-CR-1994-0020
11. SUPPLEMENTARY NOTES Armstrong Laboratory Technical Monitor: Lieutenant Colonel John G. Garland III, (210) 536-3305			
12a. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution is unlimited.			12b. DISTRIBUTION CODE
13. ABSTRACT (Maximum 200 words) This report is an addendum to the Storm Water Pollution Prevention Plan (SWPPP) for Scott AFB, dated 28 February 1994. It addresses the issue of complying with requirements of the Illinois Storm Water General Permit for Industrial Facilities. Contents of the SWPPP have been reviewed to determine what additions or revisions may be necessitated by the Illinois program. Additionally, the fundamental elements of implementing the SWPPP are summarized, so as to serve as a general reference to fulfilling requirements of the Illinois Permit.			
14. SUBJECT TERMS NPDES: Regulatory compliance - environmental Storm water Pollution prevention			15. NUMBER OF PAGES 24
			16. PRICE CODE
17. SECURITY CLASSIFICATION OF REPORT Unclassified	18. SECURITY CLASSIFICATION OF THIS PAGE Unclassified	19. SECURITY CLASSIFICATION OF ABSTRACT Unclassified	20. LIMITATION OF ABSTRACT UL

NOTICE

Pacific Environmental Services, Inc. (PES) has prepared this report for the U.S. Air Force for the purpose of aiding in compliance with the Clean Water Act. It is not an endorsement of any product. The views expressed herein are those of the contractor and do not necessarily reflect the official views of the publishing agency, the United States Air Force or the Department of Defense.

TABLE OF CONTENTS

INTRODUCTION	1
COMPLIANCE WITH ILLINOIS' GENERAL PERMIT PROGRAM	1
UPDATING THE STORM WATER MANAGEMENT PLAN	2
FUNDAMENTAL ELEMENTS OF PLAN IMPLEMENTATION	3
BASELINE BEST MANAGEMENT PRACTICES	4
DOCUMENTATION	7
PRIORITIZED TARGETS FOR POLLUTION PREVENTION	8
IDENTIFICATION OF ADDITIONAL SOURCE REDUCTION OPPORTUNITIES	9
INTEGRATION OF STORM WATER MANAGEMENT PRINCIPALS IN NEW CONSTRUCTION AND RENOVATION	10
IDENTIFICATION AND EVALUATION OF NEW PRODUCTS AND APPLICATIONS FOR STORM WATER MANAGEMENT	11
STORM WATER SAMPLE COLLECTION PROCEDURES	11
ATTACHMENT 1 MEMOS	
ATTACHMENT 2 EXAMPLES	
ATTACHMENT 3 REFERENCES TO INFORMATION SOURCES	

INTRODUCTION

Scott Air Force Base (Scott AFB) is a participant in the United States Air Force (USAF) application to the United States Environmental Protection Agency (USEPA) for a Storm Water Group Permit. During 1993, a Storm Water Pollution Prevention Plan (SWPPP) for Scott AFB was prepared in anticipation of final promulgation of the group permit. A final draft of the SWPPP was completed by Pacific Environmental Services, Inc. (PES) on 28 February 1994.

Following completion of the SWPPP, PES monitored progress of the proposed Group Permit. Upon final promulgation of the Group Permit, PES was to review the contents of the SWPPP and make any corrections or additions required by the final permit.

Various problems have contributed to substantial delays in the anticipated promulgation of a Final Group Permit. As of June 1994, comments addressing the proposed permit are being reviewed by USEPA and final promulgation is not expected until late 1994. In the interim, a number of States (including Illinois) have decided to exercise their option to include group applicants in the General Storm Water Permit programs of the respective States. Illinois Environmental Protection Agency (IL-EPA) has indicated their intention to contact Scott AFB sometime in late summer or early fall to initiate this process (See Attachment 1 - Memos).

Accordingly, this report addresses the issue of complying with requirements of the Illinois Storm Water General Permit for Industrial Facilities. Contents of the SWPPP have been reviewed to determine what additions or revisions may be necessitated by the Illinois program. Additionally, the fundamental elements of implementing the SWPPP are summarized, so as to serve as a general reference to fulfilling requirements of the Illinois Permit.

COMPLIANCE WITH ILLINOIS' GENERAL PERMIT PROGRAM

The IL-EPA plans to send a letter sometime during late summer or fall of 1994 to all industrial facilities which participated in Federal group permit applications. The letters will explain the action by the State of Illinois in assuming jurisdiction over the Storm Water Program and will outline the actions needed for participation. The facility will initiate participation by submitting a Notice of Intent (NOI) in response to the letter.

Upon submittal of the NOI, applicants will not be required to do anything more than was previously required by the group permit application. They will be required to prepare their Storm Water Management Plan, and submittal of the NOI will establish a time line for completion. No other documents or submittals will be

required by IL-EPA at this time. Copies of the completed SWPPP, as well as annual monitoring results, compliance inspection reports, and plan updates are retained on-site by the permit holder.

For Scott AFB, the existing SWPPP meets all requirements of the Illinois General Permit. The SWPPP was developed to comply with requirements as stipulated in the USEPA guidance manual: "Storm Water Management for Industrial Activities--Developing Pollution Prevention Plans and Best Management Practices." In August 1993, IL-EPA indicated this was the appropriate guidance document for facilities in Illinois.

In its submittal of a NOI for a General Storm Water Permit, Scott AFB should indicate that its SWPPP is completed and that a program of Best Management Practices (BMP) is in place. This would constitute voluntary compliance with the Illinois storm water program well in advance of deadlines associated with the NOI submittal.

UPDATING THE STORM WATER MANAGEMENT PLAN

The first annual update of the SWPPP, due in February 1995, would roughly correspond to the deadline for storm water pollution prevention management plans for new participants in the Illinois general permit program. At this time, it might be desirable to adjust the update schedule to mid-April so as to allow time for incorporation of de-icing usage rates from the preceding season. A log page for recording updates and addendum should be added to the SWPPP and the title page and introductory text can be edited, if necessary, for compliance with Illinois formats (See Attachment 2 - Examples).

Update items would include the three-year history of significant spills (outdoor spills or other events which could potentially impact storm drainage), records of de-icing application rates, notation of changes to items inventoried by the SWPPP (underground storage tank (UST) remediations, new tanks, changes to hazardous waste collection network, etc.), summary of monitoring results, summary of compliance inspection findings, and updated status of BMPs. Initial sampling of an appropriate storm event can be conducted any time during 1994, with follow-up sampling of runway and aircraft de-icing areas during the de-icing season. The sampling protocol presented in this report provides a supplement to the monitoring plan present in the SWPPP.

Update Format and Standardized Reporting

The annual update report (AUR) would constitute a stand alone document which serves as an addendum to the SWPPP. Any updates or revisions to the original

contents of the SWPPP would be notated within the annual update report. Alternatively, updated information could be presented in tabular form within the AUR so as to leave the original SWPPP unchanged. For example, each AUR would present routine information (reported spills, de-icing applications) for the preceding year. Events which directly impact storm water management (i.e., new de-icing procedures) would be reported in greater detail. Significant documents or programs which impact storm water management (revised spill plan, HAZMAT tracking system, etc.) would be noted and incorporated by reference.

Established procedures such as the ECAMP inspections can be utilized so as to routinely address storm water specific issues on a continuing basis. This step would formalize storm water inspections performed in prior ECAMPs and would establish a baseline record for the monitoring program recommended in the SWPPP. Finally, storm water pollution prevention strategies should be incorporated in the periodic updates of other Basewide management plans (Spill Prevention and Response, HAZMATs, Hazardous Wastes, etc.).

At this time, the only report required by the State of Illinois will be an annual report of spill incidents and cleanup efforts in response to the spills. If no spills have occurred in the previous year, the report need only note this fact. This spill report would constitute a routine subsection of the AUR.

FUNDAMENTAL ELEMENTS OF PLAN IMPLEMENTATION

Successful implementation of the SWPPP at Scott AFB will require effort and initiative in several basic areas. Among these are:

- Baseline Best Management Practices (BMPs).
- Documentation.
- Prioritized targets for pollution prevention.
- Identification of additional source reduction opportunities.
- Integration of storm water management principles in new construction and renovation.
- Identification and evaluation of new products and applications for storm water management.

Although much of the discussion of recommended actions tends to focus on structural control issues, it is important to note that the primary emphasis of the storm

water regulations is on non-structural issues. The regulations are intended to minimize contamination of storm water runoff through standard pollution prevention approaches, including; management initiatives, training, preventive maintenance, and good housekeeping. These approaches, sometimes collectively referred to as source controls, can be most effectively implemented by large centralized organizations which are able to establish and reinforce a specified standard or goal. In this respect, Scott AFB is well prepared to implement storm water initiatives through adaptation of existing mechanisms of prevention, training, inspection, (i.e., Spill Plans, ECAMP inspections, HAZMATs, etc.). The following Baseline Best Management Practices (BMPs) are a summary of these basic principles.

BASELINE BEST MANAGEMENT PRACTICES

"Baseline" BMPs are practices that are inexpensive, relatively simple, and applicable to a wide variety of industries and activities. Most industrial facilities already have these measures in place for product loss prevention, accident and fire prevention, worker health and safety, or to comply with other environmental regulations. The purpose of this section is to highlight how these common practices can be improved and tailored to prevent storm water pollution. USEPA's storm water program is emphasizing these generic measures because they can be effective, are cost-efficient, and emphasize prevention over treatment.

Good Housekeeping

Good housekeeping requires the maintenance of areas which may contribute pollutants to storm water discharges in a clean, orderly manner. The following steps are recommended:

- Maintain dry and clean floors and ground surfaces by using brooms, shovels, vacuum cleaners, or cleaning machines.
- Regularly pick up and dispose of garbage and waste material.
- Make sure equipment is working properly.
- Routinely inspect for leaks or conditions that could lead to discharges of chemicals or contact of storm water with raw materials, intermediate materials, waste materials, or products.
- Ensure that spill clean-up procedures are understood by employees.
- Provide adequate aisle space to facilitate material transfer and easy access for inspections.

- Store containers, drums, and bags away from direct traffic routes to prevent accidental spills (see Spill Prevention and Response BMP below).
- Stack containers according to manufacturer's instructions to avoid damaging the containers from improper weight distribution.
- Store containers on pallets or similar devices to prevent corrosion of the containers which can result when containers come in contact with moisture on the ground.
- Assign the responsibility of hazardous material inventory to a limited number of people who are trained in their proper handling.
- Identify all chemical substances present in the workplace. Walk through the facility and review the purchase orders for the previous year. List all of the chemical substances used in the workplace, and then obtain the Material Safety Data Sheet (MSDS) for each.
- Label all containers to show the name and type of substance, stock number, expiration date, health hazards, suggestions for handling, and first aid information. This information can usually be found on the MSDS. Unlabeled chemicals and chemicals with deteriorated labels are often disposed of unnecessarily or improperly.
- Clearly mark on the inventory those hazardous materials that require special handling, storage, use, and disposal considerations.
- Incorporate information sessions on good housekeeping practices into the facility's employee training program.
- Discuss good housekeeping at employee meetings.
- Publicize pollution prevention concepts through posters.
- Post bulletin boards with updated good housekeeping procedures, tips, and reminders.

Preventive Maintenance

The Scott AFB preventive maintenance program should include:

- Timely inspection and maintenance of storm water management devices (e.g., cleaning oil/water separators and catch basins).

- Inspection and testing of facility equipment and systems to uncover conditions that could cause breakdowns or failures resulting in discharges of pollutants to surface waters.
- Proper maintenance of facility equipment and systems, which includes identification of equipment that needs to be inspected, scheduled periodic inspections, timely adjustment, and maintenance of complete records.

Visual Inspections

Visual inspections are meant to be routine observations of Scott AFB facilities to identify conditions which may give rise to contamination of storm water runoff with pollutants from the facilities. The following steps should be taken:

- Identify qualified plant personnel who will inspect plant equipment and areas at appropriate intervals in the plan.
- Track results of inspections to ensure that appropriate actions are taken.
- Maintain records of all inspections.

Spill Prevention and Response

Scott AFB has developed a plan in this regard, and it should be reviewed and updated to address the objectives of the SWPPP. In general, the following actions should be taken to plan for spill prevention and response:

- Identify areas where spills can occur on-site and their drainage points.
- Specify material handling procedures, storage requirements, and use of equipment such as diversion valves, where appropriate.
- Identify procedures used for cleaning up spills and inform personnel about these procedures.
- Provide the appropriate spill clean-up equipment to personnel.

Sediment and Erosion Control

Sediment and erosion control issues at Scott AFB are discussed in the SWPPP. A routine inspection program should be instituted to identify additional areas which, due to topography, activities, or other factors, have a high potential for significant

soil erosion, and identify structural, vegetative, and/or stabilization measures that can be used to limit erosion.

Management of Runoff

Traditional storm water management practices should be considered and used to divert, infiltrate, reuse, or otherwise manage storm water runoff in a manner that reduces pollutants in storm water discharges from the site. These measures may include vegetated swales, inlet controls, infiltration devices, and detention devices. Most of these measures are already in practice, whereas others have been identified in the site-specific BMPs. However, these practices should be appropriately considered whenever routine inspections reveal a need for their implementation.

Employee Training

All Base employees should be indoctrinated with environmental requirements, pollution prevention methods, and BMPs. Considering routine turnover at the Base, it is important that this training be given to all employees at the time of Base assignment, continued in the individual unit, and practiced at the individual work area/facility, on a regular basis. It is recommended that periodic monthly, quarterly, and annual training sessions be held as appropriate for the successful implementation of the SWPPP. Furthermore, to instill BMPs as routine in employees, the Base media and information resources should be used to the fullest potential. Finally, the employee work-related evaluations should include their participation in training and implementation activities of the SWPPP.

DOCUMENTATION

Closely related to non-structural initiatives is the issue of documentation. Over the years, the person who administers the SWPPP should be able to demonstrate the extent to which implementation of the SWPPP has been integrated into established environmental management programs Basewide. Additionally, he or she should be able to quantify reductions in the quantity of contaminants released or document accomplishments which reduce the risk of exposure to storm water. Conversion from urea to potassium acetate for runway de-icing at Scott AFB would be an example of a quantifiable event. An effort to eliminate storm flow infiltration to sanitary sewers and reduce the risk of treatment plant bypasses is a documentable accomplishment which is less amenable to quantification. The required annual update reports (discussed previously) would be the appropriate mechanism for documenting and quantifying such accomplishments.

PRIORITIZED TARGETS FOR POLLUTION PREVENTION

As indicated in the Scott AFB SWPPP (pg 5-1), the three primary sources of contaminants from the Base are:

- runway de-icing effluent (urea)
- aircraft de-icing effluent (propylene glycol)
- fueling related spills and leaks

As a general principle, implementation of any pollution prevention strategy should be prioritized with respect to the most cost-efficient strategies for achieving pollution reductions. At Scott AFB, replacement of urea with potassium acetate for runway de-icing is probably the best available option for immediately reducing contaminant levels from this source. From a regulatory point of view, this reduction may be enough to constitute a permanent solution.

The issue of reducing effluents from aircraft de-icing practices is the next major area of concern. A number of control ideas have been considered, including installation of de-icing stations which would contain effluents from the de-icing operations. However, a comprehensive approach to the issue should evaluate a broader range of options. For example, certain interim strategies could produce immediate reductions in effluent quantities while the benefits of constructing a de-icing station would take several years to be realized. Such interim measures could be implemented while design/evaluation of long term measures proceeds. If sufficient reductions are achieved through these approaches, capital intensive structural containment projects may not be necessary.

A straightforward interim strategy involves a change in aircraft de-icing procedures so as to minimize the quantity of glycol utilized. Traditionally, a 50/50 mixture of heated water and glycol is sprayed on the aircraft to remove accumulated ice and to temporarily prevent refreezing. However, equivalent results may be obtained by initially de-icing the aircraft with hot water only (or a 90/10 ratio of water and glycol) and following this step with a finishing application of glycol to prevent refreezing. Implementing such a strategy may require modification of de-icing application equipment and should be carefully researched with respect to safety and applicability to local conditions.

When structural approaches are evaluated, their design should incorporate Basewide issues of containment/spill control infrastructure. This approach broadens the focus from storm water specific (de-icing effluents) to include "major" spills, runway foaming, and potential effluents from a major fire-control event. This broader focus creates opportunities for design of multi-purpose projects. For example, a de-icing station located on the Main Ramp would contain effluents from a localized area, but would have no effect on other portions of the Ramp. Installation

of a system which permits selective containment of any run-off from the Ramp would allow for containment/recovery of major fuel spills and AFFF releases in addition to containing de-icing effluents.

Finally, addressing the issue of spills and leaks related to fueling operations involves a number of concerns at Scott AFB, wherever such functions occur outdoors. Implementation of management, procedural, and training efforts are required to effectively minimize and contain the relatively large numbers of leaks and spills associated with these activities. Effective utilization of other programs (Spill Prevention and Response, Pollution Prevention, etc.) can contribute to achieving progress in this area.

IDENTIFICATION OF ADDITIONAL SOURCE REDUCTION OPPORTUNITIES

The effort to identify and minimize additional sources implies a broadening of focus beyond the previously defined activities subject to industrial storm water regulations. Such an expanded focus should also incorporate general non-point source pollution prevention issues. This would constitute a Basewide commitment to impact minimization and general enhancement of water quality from all sources at Scott AFB.

Current road and parking lot maintenance practices provide an example of additional pollution prevention opportunities. During winter, it may be possible to reduce the quantities of road salt and sand through a review of current application procedures and through use of calcium magnesium acetate (CMA) or liquid potassium acetate (KA) as supplements. Additionally, street sweeping and vacuuming procedures should be reviewed with respect to minimizing storm water impacts.

Another area of opportunity is the utilization of site controls to reduce the rate and volume of storm water runoff and filter out some of the runoff pollutants. Site controls focus on the directly connected impervious area (DCIA), which is defined as the impermeable area that drains directly to the improved drainage system, i.e., paved gutter, improved ditch, or pipe. The minimization of DCIA is by far the most effective method of runoff quality control because it delays the concentration of flows into the improved drainage system and maximizes the opportunity for rainfall to infiltrate at or near the point at which it strikes the ground.

Site controls are generally applied to runoff from roofs, parking lots, and roads. The basic principle is to provide a mechanism to slow down the runoff and promote pollutant removal through settling, filtering, or infiltration. Grassed swales and filter strips, infiltration basins and trenches, and flow spreaders to permit sheet flow through vegetated buffers are the principal mechanisms employed.

INTEGRATION OF STORM WATER MANAGEMENT PRINCIPALS IN NEW CONSTRUCTION AND RENOVATION

Accomplishments in this area offer the best opportunities for long-term solutions to peak flow rates and runoff contamination from impervious surfaces Basewide. Additionally, incorporation of storm water management principles in the design phase will generally be more cost-effective than after-the-fact approaches. For example, material and finish coating specifications can be incorporated in a roofing rehabilitation project so as to minimize the discharge of zinc from building surfaces. The same project could also redirect roof gutters and downspouts through a landscaped infiltration area rather than directly discharging to storm sewers.

Many of the storm water management principles are compatible with traditional landscaping aesthetics. These include the use of graveled surfaces, open water, grassed areas, and vegetation plantings. Long-term maintenance costs of the storm water management components can also be minimized through careful planning and integration with other elements of the development.

Success in this area will require the establishment of mechanisms to assure appropriate incorporation of storm water criteria in design of new facility installations, building renovations, Base planning, and related programs. Review by the Environmental Management Office (EMO) should be established early in the design phase so as to maximize opportunities to incorporate general pollution prevention initiatives. Oversight of renovation projects will provide an opportunity to identify and correct any overlooked or hidden deficiencies on a case-by-case basis. This review role can be incorporated within established EM responsibilities for environmental compliance review.

IDENTIFICATION AND EVALUATION OF NEW PRODUCTS AND APPLICATIONS FOR STORM WATER MANAGEMENT

A number of existing products and established construction techniques have been adapted to storm water management applications. These include constructed wetlands principles, geotextiles, and interlocking paving blocks (for porous paved surfaces). A few new products are available or in development. One example is a hydrocarbon filter and sedimentation device which can be installed directly in existing storm drainage inlets. Numerous additional products and related applications can be expected within the next few years as storm water regulations take effect. References to some potential information sources are presented in Attachment 3.

STORM WATER SAMPLE COLLECTION PROCEDURES

As currently described, the Illinois General Permit will not require sampling and analysis of storm water discharges to be performed on a periodic basis. However, sampling and analysis of storm water discharges can be an effective means of monitoring and documenting the storm water management program at Scott AFB. A minimal program would collect grab samples during warm weather once per year from outfalls 1, 2, and 3 to be analyzed for oil and grease, BOD5, COD, TSS, pH, and any other analytes (metals, chlorine, etc.) deemed appropriate to the interests of Scott AFB. These samples would be collected during a storm event as defined below. Grab samples should be collected once per year from Outfalls 1, 2, and 3 and analyzed for de-icer compounds. Ideally, this sampling would be conducted within one hour following a period of runway and aircraft de-icing. The timing of the de-icer sample collection would not be expected to meet the definition of a storm event.

The duration of the storm event, measured precipitation, and the duration between storm events should be monitored through the Base weather station. Volume estimates for discharges associated with the storm event can be generated from either electronic flow measurement equipment or calculated from manual depth measurements taken during the storm event. Electronic flow measurement equipment includes either bubbler or ultrasonic type probes that can be equipped with data loggers. Manual flow measurements require finding the slope of each discharge pipe, manually measuring flow depth during the storm event, and applying Manning's equation to determine flow rates.

Both grab and composite samples can be collected once annually. The grab sample must be taken in the first thirty minutes of the storm event discharge. The composite sample can be either flow or time weighted as a combination of at least three aliquots taken in each hour over the duration of the storm event discharge or for the first three hours. Grab samples only are required for the pH and oil and grease samples.

The following are the recommended sample collection procedures to be used at each outfall.

1. Prior to collection, rainfall events should be monitored through the Base weather station. Before a storm event is sampled, it should be documented that there has been a dry period of 72 hours.
2. Sample bottles with the appropriate preservatives for grab and composite samples should be obtained from the laboratory that will perform the analyses. If automated sampling equipment is used, the samplers must be in place before the rainfall begins.

3. If manual rain gauges are used to measure precipitation, they should be in place prior to the beginning of the storm event. Immediately when rainfall begins, record the date and time.
4. Within 20-40 minutes after the storm event begins the grab samples should be taken and the initial flow measurements should be taken.
5. Composite samples and flow measurements (if taken manually) should then be taken every 20 minutes for the duration of the storm event or three hours, whichever is shorter.
6. After the conclusion of the storm event, verify that at least 0.10 inches of precipitation has fallen. The composite samples should be combined and aliquotted to the appropriate containers. The duration and total precipitation of the storm event should be recorded and the flow calculations should be completed as required.
7. All of the results from the annual sampling should be compiled and included as part of the SWPPP. Storm water monitoring is not required to be submitted to the IL-EPA.

Cost

Several options will need to be considered when selecting the most economical approach to collecting the required storm water samples. Cost impacts should be included in deciding whether automated or manual sampling methods are used and whether all of the outfalls are to be sampled at once or if they will be sampled periodically. The estimated costs to sample an individual outfall are summarized in Table 4.

TABLE 4 Cost of Alternative Sampling Methods		
	Automated Equipment	Manual Methods
Equipment (Including Sample Bottles)	*\$7,500 (purchase price) or \$1,800 (monthly rental)	\$100
Lab Analysis	\$300	\$300
Labor		
Set-up	4 hours	4 hours
Sampling (Includes Compositing)	2 hours	8 hours
Reporting and Calculations	8 hours	12 hours
*Purchase price includes wastewater sampler (\$3,000), flow meter (\$3,300), rain gauge (\$750), cables, batteries, sampling line, etc. (\$450).		

Purchasing three full sets of automated sampling equipment would require a one-time capital cost of approximately \$22,500. Since the outfalls are scattered all across the Base, simultaneous manual sampling of the outfalls would require a sampling person at each site. Therefore, an approach that samples one or two outfalls at a time is recommended. For example, automated sampling at one outfall per storm event would reduce the one-time equipment cost to approximately \$7,500 and would require only one or two people to collect the samples. Without automated equipment, a two person team could manually collect samples from two outlets per storm event.

ATTACHMENT 1

MEMOS

PACIFIC ENVIRONMENTAL SERVICES, INC.
FAX NO. (513) 398-3342
TELEPHONE NO. (513) 398-2556

MEMORANDUM

TO: Msgt Suarez
375 AW/EMO
Scott AFB

FROM: Eric Hollins

SUBJECT: Storm Water Management - State of Illinois, Program
Administration

DATE: June 15, 1994

I called the Illinois EPA, Water Pollution Control Division, regarding the current status of the Storm Water Program. I was informed that Sue Epperson is no longer the Storm Water point of contact. Al Trivedi or George Patino are now responsible for questions addressing storm water regulations in Illinois. They are available at the same number; 217-782-0610. However, neither was in at the time.

On June 14, I spoke by phone with George Patino. He confirmed that Illinois is in the process of assuming jurisdiction over all USEPA group permit applicants. Everyone is to be covered under the Illinois General Permit Program. Scott AFB can expect to receive a letter from the Il-EPA which will assign a Permit Number to the Base and explain what actions need to be taken. These actions include; completion of a Storm Water Pollution Prevention Plan within 180 days of receiving the letter and submittal of an annual Spill Report for storm water related incidents. The Plan is to be maintained on Base, Illinois will not require a copy. No monitoring, sampling, or other form of reporting will be required at this time.

PACIFIC ENVIRONMENTAL SERVICES, INC.
FAX NO. (513) 398-3342
TELEPHONE NO. (513) 398-2556

MEMORANDUM

TO: Bill Courtney
375 AW/EMO
Scott AFB

FROM: Eric Hollins

SUBJECT: Storm Water Management - State of Illinois, Program
Administration

DATE: May 13, 1994

I talked by phone (5/9/94) with Sue Epperson regarding the status of the Illinois Storm Water Program and their plans for assuming state administration of federal group applicants. She informed me that Illinois has begun sending out letters to all industrial facilities which participated in federal group permit applications. The letters are being mailed alphabetically and it may be 2 or 3 weeks before Scott AFB receives theirs. The letters inform recipients that they:

- 1) are now covered under the Illinois general permit program.
- 2) will not be required to do anything more than previously required by the group permit application.
- 3) will be required to prepare their stormwater pollution prevention plan and will be given a schedule for completion.
- 4) will not be required to submit any documents or other response at this time.
- 5) will be required to submit an annual update report addressing the status of their stormwater plan.

The above action by Illinois is consistent with information provided to me by Carmelita White, USEPA Stormwater Program, (202) 260-6053. She stated (by phone, 5/9/94) that Illinois already has "federally delegated authority" for its NPDES Stormwater program and has the option to include industrial stormwater facilities under their own general permit program. This applies to DOD facilities which participated in the federal group permit process.

Ms. White indicated that a number of states are currently exercising their option to assume jurisdiction of such facilities. This action eliminates potential inconsistencies between similar facilities within the same state, and resolves ongoing confusion and delays associated with the proposed multi-sector permit.

ATTACHMENT 2

EXAMPLES

UPDATE AND ADDENDUM LOG
STORM WATER MANAGEMENT PLAN
FOR
SCOTT AIR FORCE BASE

Addendums

Regulatory Jurisdiction

21 June 1994

SECTION 1

INTRODUCTION

Storm water discharges have been increasingly identified as a significant source of water pollution in numerous nationwide studies on water quality. To address this problem, the Clean Water Act Amendments of 1987 required the United States Environmental Protection Agency (USEPA) to publish regulations to control storm water discharges under the National Pollution Discharge Elimination System (NPDES). USEPA published storm water regulations on 16 November 1990 which require certain dischargers of storm water to "waters of the United States" to apply for NPDES permits. "Waters of the United States" is generally defined as surface waters, including lakes, rivers, streams, wetlands, and coastal waters. NPDES storm water discharge permits will allow the States and USEPA to track and monitor sources of storm water pollution.

According to the 16 November 1990 final rule, facilities with a "storm water discharge associated with industrial activity" are required to apply for a storm water permit. USEPA has defined this phrase in terms of 11 categories of industrial activity that include: 1) facilities subject to storm water effluent limitations guidelines, new source performance standards, or toxic pollutant effluent standards under 40 CFR Subchapter N; 2) "heavy" manufacturing facilities; 3) mining and oil and gas operations with "contaminated" storm water discharges; 4) hazardous waste treatment, storage, or disposal facilities; 5) landfills, land application sites, and open dumps; 6) recycling facilities; 7) steam electric generating facilities; 8) transportation facilities, including airports; 9) sewage treatment plants; 10) construction operations disturbing five or more acres; and 11) other industrial facilities where materials are exposed to storm water. Standard Industrial Classification (SIC) codes are used to identify those manufacturing facilities categorized as "heavy."

The storm water regulations address three permit application options for storm water discharges associated with industrial activity. The first option is to submit an individual application. The second option is to participate in a group application. The third option is to file a Notice of Intent (NOI) to be covered under a general permit in accordance with the requirements of an issued general permit. Regardless of the permit application option a facility selects, the resulting storm water discharge permit will contain a requirement to develop and implement a Storm Water Pollution Prevention Plan (SWPPP). The United States Air Force (USAF) has decided to submit a group application.

In anticipation of this permit requirement, the USAF has directed all of the Bases involved in their group application submittal to prepare a SWPPMP which includes all the components of a storm water pollution prevention plan as outlined in USEPA guidance for general permit holders. Pacific Environmental Services, Inc. (PES) is preparing this SWPPMP for Scott AFB through PES' contract with the USAF Armstrong Laboratory.

Section 2 of the plan addresses organizational responsibilities consisting of a description of the storm water management team at Scott AFB and implementation procedures to be followed. Section 3 presents the general characteristics of Scott AFB, including site history, topography, and general management of the Scott SWPPMP. This section also includes a description of each drainage area and outfall with regard to industrial activities and potential sources of storm water pollution. Section 4 identifies sources of non-storm discharges and summarizes the survey procedures employed to identify them. Section 5 describes the management practices for storm water pollution prevention, including process modifications and structural controls. Section 6 describes ongoing compliance and monitoring activities including inspection procedures and monitoring parameters such as analytes, locations, and sampling frequencies.

UPDATE NOTES

APRIL 1995

The initial update to the Storm Water Pollution Prevention Plan for Scott AFB includes an up-to-date history of significant spills, records of aircraft and runway de-icing applications, a summary of monitoring results, a summary of storm water inspections and findings, status of best management practices, and inventory updates. Additionally, the SWPPP has been reviewed for compliance with requirements of the Illinois Storm Water General Permit Program. As updated, this document constitutes the Storm Water Pollution Prevention Plan (SWPPP) for the Illinois General Permit.

SECTION 2

PLAN ORGANIZATION

PURPOSE

This document is the SWPPP for Scott AFB, prepared in support of the USAF group application for a NPDES Storm Water Discharge Permit. This SWPPP provides guidance for the immediate implementation of a program of storm water quality control. It contains all the components of a storm water pollution prevention plan as outlined in current USEPA and Illinois EPA guidance.

IMPLEMENTATION/MANAGEMENT TEAM

The Environmental Management Office (EMO), 375 AW/EMO has overall responsibility for environmental compliance at Scott AFB, including storm water pollution prevention. The Wastewater Program Manager has the primary responsibility for development and implementation of the storm water pollution prevention plan.

The EMO will:

- Obtain and maintain all necessary permits for the discharge of industrial storm water;
- Maintain records pertaining to storm water pollution prevention;
- Coordinate inspection activities to maintain and improve storm water pollution prevention;
- Prepare a SWPPMP and update it as required by Federal, State, and local authorities;

ATTACHMENT 3

REFERENCES TO INFORMATION SOURCES

REFERENCES TO INFORMATION SOURCES

U.S. Environmental Protection Agency
Office of Wastewater Enforcement & Compliance
401 M Street, SW
Mail Code EN-336
Washington, DC 20460
202-260-9808 (Jim Edward)
202-260-6053 (Carmelita White)

Illinois Environmental Protection Agency
Water Pollution Control Permits Section
P.O. Box 19276
2200 Churchill Road
Springfield, IL 62794
217-782-0610 (George Patino)

Maryland Department of the Environment
Water Management Administration
2500 Broening Highway
Building 30, 1st Floor
Baltimore, MD 21224
410-631-3543

Water Environment Federation
601 Wythe Street
Alexandria, VA 22314-1994

American Society of Civil Engineers
345 East 47th Street
New York, NY 10017-2398